

STATE OF MONTANA JOB DESCRIPTION



Montana state government is an equal opportunity employer. The State shall, upon request, provide reasonable accommodations to otherwise qualified individuals with disabilities.

Job Title: Electrical Civil Engineering Specialist **Working Title:** Electrical Civil Engineering Specialist

Position Number: 36015

Pay Band: 6

Division and Bureau:
Highways and Engineering Division
Traffic and Safety Bureau

Job Code Number: 172516

Section:
Traffic Design Section

Location: 2701 Prospect Avenue
Helena, MT 59601

FLSA Status: ☒ **Non-Exempt** ☐ **Exempt**

Description of the Work Unit:

The Montana Department of Transportation's (MDT) Highways and Engineering Division prepares projects for bidding and coordinates highway construction through two primary functions: Preconstruction and Construction. Specific Preconstruction functions are administered by the Bridge, Consultant Design, Engineering Operations, , Highways, Right-of-Way, and Traffic and Safety bureaus in addition to five District Construction Offices in Billings, Butte, Great Falls, Glendive, and Missoula for budget purposes. Specific Construction functions are administered by the Contract Plans, Construction Engineering Services, Construction Administration Services, and Materials Bureaus.

The Traffic and Safety Bureau is responsible for managing and coordinating highway safety programs and for providing management, design and technical support with respect to traffic engineering within the department. The Bureau is responsible for developing and reviewing plans and specifications for highway safety projects including signing, geometric features, pavement marking, lighting, signals, roundabouts and hazard elimination. Functions include developing policies and guidance on safety issues; identifying crash clusters and designing countermeasures to crash trends; developing an annual safety program based on cost/benefit analysis of crash clusters; improving safety by addressing occupant protection and driver behavior. Other Bureau responsibilities include conducting speed zone, capacity, corridor and related studies; and railroad crossing safety and grade separations. The Bureau provides safety and traffic information, reviews, and expertise for design and construction professionals, other agencies and the public; provides traffic and safety engineering expertise to district maintenance and construction personnel and city or county personnel through the District Traffic Engineers; and provides expertise and testimony on tort claims. The Bureau consists of the Traffic Safety Section, Traffic Design Section and the Traffic Operations Section.

Job Overview:

This position performs professional Traffic Engineering work involving the location and design of projects that incorporate the use of electrical devices on transportation facilities under the jurisdiction of the Department of Transportation. This position also performs professional Traffic Engineering work involving construction management of projects incorporating the use of electrical devices on transportation facilities statewide. This position assists with the maintenance of all electrical traffic

control devices on roadways under the jurisdiction of the Department of Transportation. This position is responsible for the review of electrical submittals for highway construction projects in the state and insures that associated electrical and traffic engineering activities are completed in a coordinated and timely fashion consistent with the Department's objectives.

Working conditions involve primarily office oriented activities with some occasional outside field activities. Travel is required on average once a month, with occasional overnight stay. Employee must understand the potential hazards working with electrical and electronic equipment. Field inspections typically take place within an active roadway environment.

Essential Functions (Major Duties or Responsibilities): *These job functions are the essential duties of the position and are not all-inclusive of all the duties the incumbent may be assigned.*

A. Traffic Signal and Lighting Design 70% of Time

1. Designs and prepares plans for traffic signals, signal interconnection systems, roadway lighting, flashers, vehicle detection, and other related electrical and traffic work. Prepares details and cost estimates for various types of traffic signal equipment, traffic controllers, roadway lighting, and other traffic control devices involving electrical and electronic components. Writes special provisions to assist manufacturers, contractors, and field inspectors in the construction of the designed facilities.
2. Coordinates design efforts with other units within the Traffic Engineering Section and other sections in the Department to assure compatibility and progress during the preconstruction phase of each project assigned. Coordinates design with utilities to minimize conflicts and/or relocations and to ensure proper power supply. Reviews compatibility with terrain, right-of-way, utilities, and proposed roadway geometry. Provides technical assistance to others often not familiar with the traffic equipment capabilities and constraints.
3. Reviews the electrical plans for consultant design and developer projects to ensure compliance with applicable MDT, federal, state, and local standards and to ensure designs are cost-effective, constructible, biddable, and accurate. Presents comments to MDT design managers or consultants directly to bring plan packages into compliance with standards. Provides detailed design information in the form of CADD files and special provision when necessary for correction of plans.
4. Performs Traffic Engineering analyses involving warrants based on the Manual on Uniform Traffic Control Devices (MUTCD), which justify the need for the proposed installation. Identifies the proper type of electrical equipment to be installed. This involves evaluating traffic volumes, levels of service, site conditions, possible alternatives, capacity, longevity, and equipment operating parameters. For the various alternatives, performs technical evaluations and calculations, such as voltage drops, conduit fills, inductance, and connected loads.
5. Attends preliminary field reviews and plan-in-hands to identify project work scopes and ensures constructible design plans. Writes associated reports to document comments and decisions generated from the meetings.
6. Prepares project related correspondence such as requests for information, requests of other offices to carry out their part in project related activities (i.e. Environmental Document), and plan transmittals.

B. Traffic Signal Operations, Construction and Maintenance 20% of Time

1. Prepares state furnished traffic equipment for installation in the field. Preparation includes testing all features of the signal equipment to ensure it has been built to specifications. Upon completion of the testing, configures state furnished electrical equipment for the specific project by enabling and disabling elements according to project plans and intended operation.

D. Other Duties as Assigned

10% of Time

1. Perform a variety of other duties as assigned by the Traffic Design Engineer or Traffic Project Engineer including project design and assistance with project management on design projects with electrical components. Write project reports, survey requests and other technical memos involving electrical, signing, geometric and safety design components and other related duties as assigned.

Behaviors required to perform these duties:

See MDT Core Behaviors

Supervision

The number of FTE employees directly supervised is: **0.0**

List the complexity levels/pay bands of each those subordinates: **N/A**

Please list the Position Numbers for those directly supervised: **N/A**

Is this position responsible for (please check ONLY those boxes which apply to the position and for which the position has "signatory" authority.)

- | | | |
|---|---|-------------------------------------|
| <input type="checkbox"/> Hiring | <input type="checkbox"/> Layoffs/termination of temporary or seasonal workers | |
| <input type="checkbox"/> Performance Management (conducting and signing performance appraisals as the direct supervisor or the reviewing manager) | <input type="checkbox"/> Promotions | |
| <input type="checkbox"/> Direct /Line Supervision | <input type="checkbox"/> Leadworker | <input type="checkbox"/> Discipline |
| <input type="checkbox"/> Other: | | |

Minimum Qualifications (Education and Experience):

This position requires education and experience equivalent to a Bachelor of Science degree in Electrical/Electronic Engineering, Traffic Engineering, or other related field; preferred thirty months of Highway engineering experience in project planning, design, construction, or maintenance; preferred to

have 18 months in the field of traffic engineering as it relates to the design, operation, and maintenance of traffic signals.

Required Knowledge and Skills: The position requires considerable knowledge of the theories, principles, methods, and techniques of Traffic Engineering and Electrical/Electronic Engineering with emphasis on traffic signals, signal systems & communication, and roadway lighting; knowledge of Department and Section procedures and policies, as well as Federal, State, and local laws and regulations that may affect the use of electrical devices; knowledge of standards, techniques, and engineering alternatives offered in the Manual on Uniform Traffic Control Devices, AASHTO policies, and the Highway Capacity Manual.

The position requires skill in organizing work, resolving complex design constraints, exercising sound engineering judgment; skill in the use of engineering instruments in the field and office (computers and traffic signal control equipment); skill in the use of computer software (MicroStation CADD software, Word, Excel, and Highway Capacity Software).

Special Requirements:

List any other special required information for this position

- | | |
|--|--|
| <input type="checkbox"/> Fingerprint check | <input checked="" type="checkbox"/> Valid driver's license |
| <input type="checkbox"/> Background check | <input checked="" type="checkbox"/> Other; Describe |

Registration as an Engineer Intern in Montana

The specific statements shown in each section of this description are not intended to be all inclusive. They represent typical elements and criteria considered necessary to perform the job successfully.

Signatures

My signature below indicates the statements in the job description are accurate and complete.
Signature indicates this statement is accurate and complete.

Employee:

Name: _____

Title: _____

Signature: _____

Date: _____

Immediate Supervisor:

Name: _____

Title: _____

Signature: _____

Date: _____

Bureau Chief:

Name: _____

Title: _____

Signature: _____

Date: _____

Division/District Administrator:

Name: _____

Title: _____

Signature: _____

Date: _____

Department Designee:

Designee

Chief Human Resources Officer
Human Resources Division

Signature: _____

Date: _____